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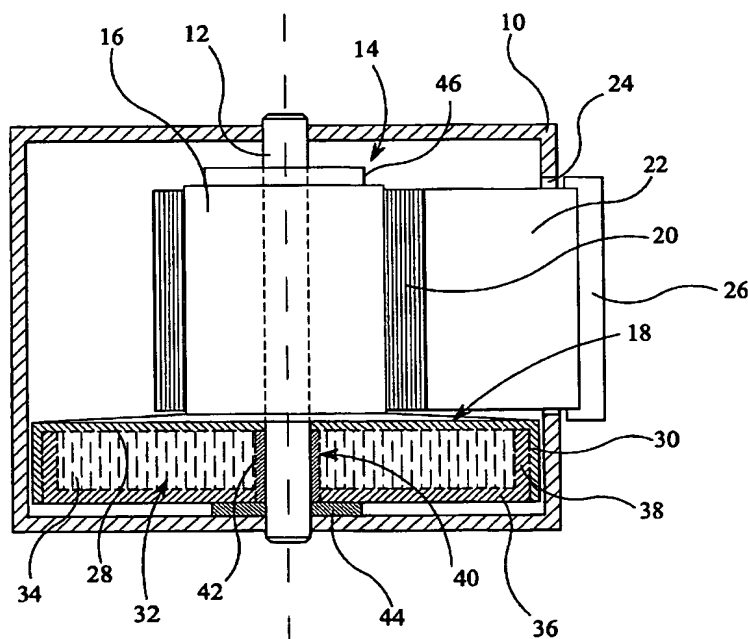
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(54) Title: RETRACTABLE BARRIER SYSTEM



(57) Abstract: A retractable barrier system comprises a support member, for example in the form of a housing (10), a spool (14) supported for rotation by the support member, a spring (34) adapted to apply a biasing load to the spool (14), and a skirt (30) arranged to deflect water away from or around the spring (34) thereby reducing the quantity of water impinging, in use, on the spring (34) and reducing corrosion thereof.

## **Retractable Barrier System**

This invention relates to a retractable barrier system. The invention relates in particular to a retractable barrier system suitable for outdoor use, but is not restricted to arrangements intended for such use.

5       A retractable barrier system typically comprises a housing within which a rotatable spool is mounted. A length of webbing is carried by the spool, the webbing typically carrying, at a free end thereof, part of a catch arrangement or attachment means to allow the free end of the webbing, when withdrawn from the housing, to be secured to an object spaced, or to be spaced, apart from the housing  
10   to form a barrier between the housing and the object to which the end of the webbing has been secured. A spring arrangement is provided within the housing to apply a biasing force to the spool such that, upon withdrawal of the webbing from the housing causing rotation of the spool, a load is applied to the spool urging the spool to rotate to retract the webbing into the housing. As a result, when slack is  
15   induced in the webbing the webbing of the barrier retracts into the housing.

Retractable barriers are used in a wide range of applications. For example, barriers of this type are commonly installed, indoors, at supermarket check-outs for example to indicate which check-outs are closed, or as queue management systems. Barriers of this type are also used outdoors, again, for example, in queue

management systems.

When used outdoors, the retractable barriers are obviously exposed to conditions far more extreme than when used indoors. For example, when used outdoors, the webbing may become damp or wet. If retracted into the housing  
5 whilst still damp or wet, then there is the risk that water may come into contact with, for example, the spring or other components of the barrier which may then corrode. It will be appreciated that the manner in which water comes into contact with, for example, the spring may either result from water dripping or running out of the webbing and onto the spring, or may result from the water evaporating from the  
10 webbing and condensing on the spring.

It is an object of the invention to provide a retractable barrier system suitable for use in outdoor applications in which the disadvantages set out above are of reduced effect.

According to the present invention there is provided a retractable barrier  
15 system comprising a support member, a spool supported for rotation by the support member, a spring arranged to provide a biasing load to the spool, and a skirt arranged to deflect water which would otherwise impinge on the spring.

The skirt may be carried by the spool.

Clearly, by providing a skirt adapted to deflect water away from or around

the spring, the risk of water coming into contact with the spring is reduced and as a result, the likelihood of corrosion of the spring is also reduced.

The retractable barrier system is conveniently designed such that, in use, when webbing is carried by the spool, the spring is located beneath the webbing, the skirt being located between the webbing and the spring.

By locating the spring so that, in use, it is beneath the webbing, the spring is less likely to be adversely effected by condensation.

The skirt conveniently forms part of the spool, and is preferably an integral part of the spool.

10 A cover may further be provided, the cover forming, with the skirt, a closed compartment within which the spring is located. The cover may act as a spring carrier into or onto which the spring may be placed during assembly.

Preferably the support member includes a fixed spindle, the spool being mounted for rotation about the spindle. Conveniently one end of the spring is anchored to the spindle or to the support member, and the other end of the spring is arranged to drive the spool.

15 The spring, or part of the spring, may be provided with a water resistant or corrosion resistant coating. As a result, moisture damage to the spring may be further reduced as the spring may be further protected against damage arising upon

the ingress of water past the skirt.

It is thought that PTFE may be a suitable coating. However, other materials may be used. Where the coating is provided on all or a significant proportion of the spring, then it is envisaged that the coating material used should be of a material  
5 which does not impede the operation of the spring, for example by significantly increasing frictional forces between the windings of the spring.

According to another aspect of the invention there is provided a retractable barrier system comprising a support member, a spool supported for rotation by the support member, and a spring arranged to apply a biasing load to the spool, wherein  
10 at least part of the spring is provided with a water-resistant or corrosion-resistant coating. By way of example, the coating may be of PTFE.

The invention will further be described, by way of example, with reference to the accompanying drawing, Figure 1, which is a diagrammatic sectional view of a retractable barrier system in accordance with an embodiment of the invention.

15 Referring to the accompanying drawing, the retractable barrier system comprises a support member in the form of a housing 10, for example of box-like steel construction although other shapes are possible and of course the housing could be manufactured of other materials. Within the housing 10 is a spindle 12. The spindle 12 is secured within the housing 10 against rotation, the spindle 12 being

orientated such that, in use, it is arranged generally vertically.

The spindle 12 carries a spool 14, the spindle 12 extending through a passage of an appropriate diameter formed in the spool 14. The manner in which the spool 14 is carried by the spindle 12 is such as to allow the spool 14 to rotate relative to the spindle 12. As the spindle 12 is orientated to extend, in use, generally vertically, it will be appreciated that the spool 14 is rotatable, in use, about a generally vertical axis. The spool 14 is shaped so as to define a region 16 of generally cylindrical form, and a skirt 18 located, in use, beneath the region 16. The region 16 has secured thereto, in use, an end of a length of webbing 20 or another elongate flexible material, the webbing 20 being wound around the region 16 of the spool 14. A slot may be provided in the region 16 of the spool 14 to enable the webbing to be secured thereto. A free end 22 of the webbing 20 extends through a slot 24 formed in the housing 10, attachment means 26 being secured to the free end 22.

The skirt 18 includes an upper wall 28 of preferably slightly downwardly angled form and a peripheral wall 30 which depends from the periphery of the upper wall 28. The skirt 18 therefore defines a cavity 32, and a coiled spring 34 is provided within the cavity 32. A spring carrier member 36 is provided which closes the cavity 32. The spring carrier member 36 may simply be a friction fit within the peripheral wall 30, or alternatively may be secured in position using adhesive.

Alternatively, a snatch groove, snap-fit coupling or screw threaded coupling may be provided between these components. In any of these arrangements, cooperatively shaped driving means may be provided, for example in the form of a key/keyway arrangement, to ensure that the spring carrier member 36 rotates with the skirt 18.

- 5 The spring carrier member 36 is shaped to include an outer peripheral wall 38 provided with a slot (not shown) or other formation with which an outer end of the spring 34 engages.

A spring anchor member 40 projects through a central opening formed in the spring carrier member 36, the spring anchor member 40 including a tubular part 42  
10 surrounding part of the spindle 12. The tubular part 42 is provided with a slot (not shown) or other formation in or with which an inner end of the spring 34 engages. The spring anchor member 40 further includes an annular plate region 44 located, in use, between the spring carrier member 36 and the housing 10 and serving as an end thrust bearing for the spool 14. The region 44 carries a plurality of projections  
15 (not shown) which extend through corresponding openings provided in the housing 10 to secure the spring anchor member 40 to the housing 10 and prevent the spring anchor member 40 from rotating.

It will be appreciated that as the spring 34 is secured between the spring anchor member 40 which is fixed against rotation and the spring carrier member 36

which is secured to, and rotatable with, the spool 14, as the free end 22 of the webbing 20 is withdrawn from the housing 10, the spool 14 will rotate causing the spring 34 to wind up. Upon slack being induced in the webbing 20 the biasing force applied by the spring 34 causes the spool 14 to rotate to retract the webbing 20 into the housing 10.

During assembly of the retractable barrier system, some pre-load or pre-stressing is applied to the spring 34, and this is conveniently achieved by providing the upper end of the spool 14 with a region 46 of, for example, hexagonal shape to permit it to be gripped by a suitable tool to assist in rotating the spool 14.

It will be appreciated that where the retractable barrier system is used outdoors, there may be occasions where the webbing 20 is retracted into the housing whilst damp or wet. During such retraction, the action of the webbing being retracted and wound onto the spool 14 may squeeze some water from the webbing 20. Further water may drain from the webbing after completion of retraction. The water will tend to impinge upon the skirt 18, the angle of the skirt 18 causing the water to flow radially outwardly and then around the peripheral wall 30. Little or no water tends to enter the cavity 32, thus the risk of corrosion damage to the spring 34 is reduced.

If additional protection for the spring against corrosion is desired, then the



spring may be provided with a water-resistant or corrosion-resistant coating. For example, the coating may take the form of PTFE. However, other materials could be used provided the material used does not unacceptably impair the operation of the spring, for example by increasing the frictional resistance to sliding between the windings of the spring. Although the whole of the spring may be provided with the coating, arrangements are also envisaged in which only part or parts of the spring are so coated. For example the coating may be provided only on the part(s) of the spring considered to be most susceptible to damage. Such areas may be, for example, the exposed end parts of the spring. It will be appreciated, however, that other parts of the spring may alternatively or additionally be coated.

It will be appreciated that a number of modifications may be made to the design described above, for example changing the shapes of various components and the materials from which they are manufactured, and that such modifications fall within the scope of the invention.

**CLAIMS**

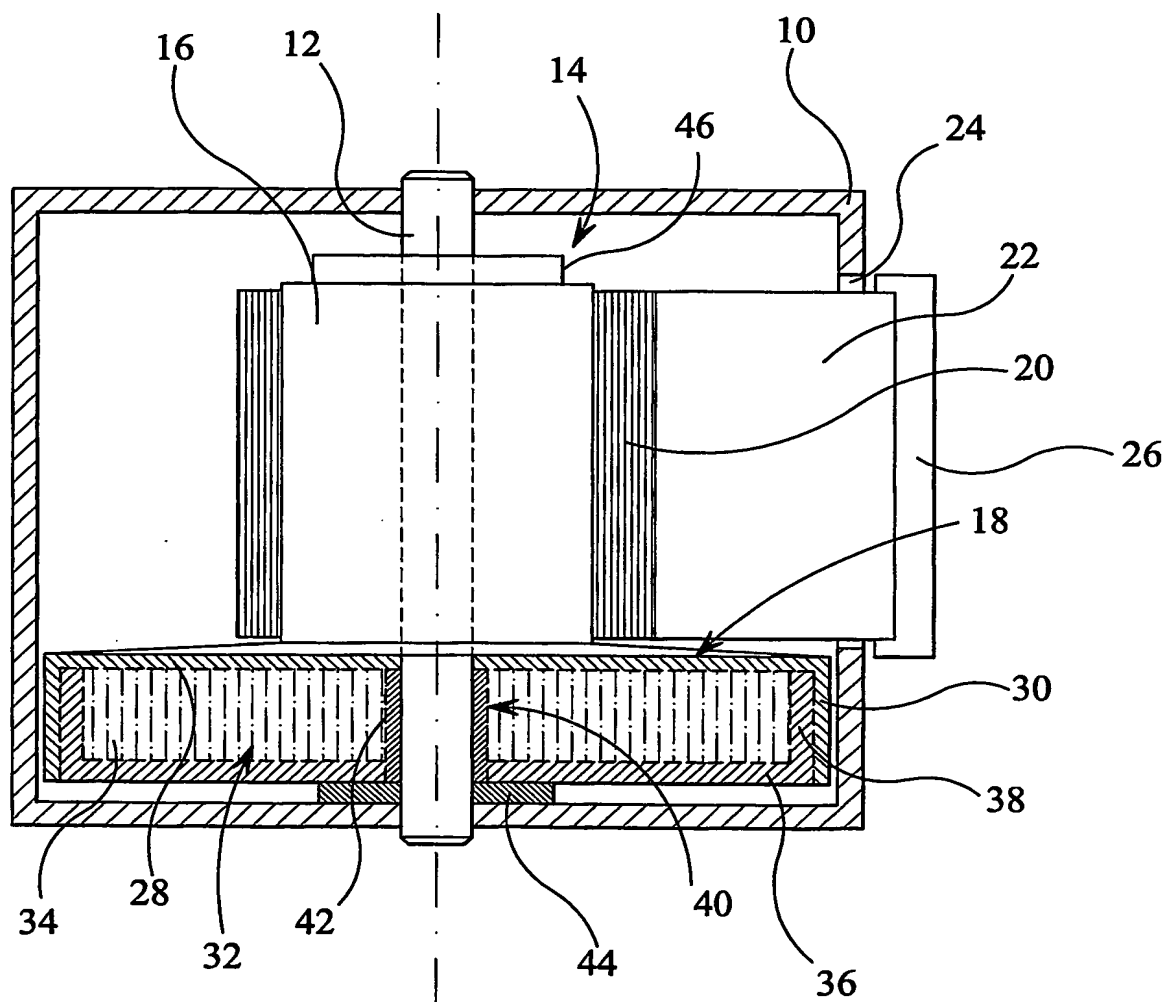
1. A retractable barrier system comprising a support member, a spool supported for rotation by the support member, a spring arranged to provide a biasing load to the spool, and a skirt arranged to deflect water which would otherwise impinge on  
5 the spring.
2. A system according to Claim 1 wherein, in use, the spring is located beneath the spool.
3. A system according to Claim 1 or Claim 2, wherein the skirt is carried by the spool.
- 10 4. A system according to Claim 3, wherein the spool and the skirt are integral with one another.
5. A system according to any of the preceding claims, further comprising a cover forming, with the skirt, a closed compartment within which the spring is housed.
- 15 6. A system according to Claim 5, wherein the cover is secured to the skirt by at least one of a snap-fit coupling, an adhesive, and a screw-threaded coupling.
7. A system according to any one of the preceding claims, further comprising a fixed spindle supported by the support member and upon which the spool is mounted for rotation.

8. A system according to Claim 7, wherein the spring includes an end part anchored to the spindle or the support member and a second end part arranged to drive the spool.

9. A system according to any of the preceding claims wherein at least a portion  
5 of the spring is provided with a water-resistant or corrosion-resistant coating.

10. A system according to Claim 9, wherein the coating comprises a PTFE layer.

11. A retractable barrier system comprising a support member, a spool supported for rotation by the support member, and a spring arranged to apply a biasing load to the spool, wherein at least a portion of the spring is provided with a corrosion-  
10 resistant or water-resistant coating.



# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/03445

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 E01F13/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E01F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2002/063248 A1 (LEVINE&MANDELBAUM) 30 May 2002 (2002-05-30) page 2, column 2, paragraph 4 -page 3, column 2, paragraph 1; figures 2,5,6	1,2,5,7, 8,11
A	DE 40 36 718 A (SEGOR GMBH & CO KG) 20 June 1991 (1991-06-20) column 3, line 19 -column 5, line 59; figures 2,5,9,10	1,2,5,7, 8,11
A	FR 2 816 338 A (MEYER JEAN JACQUES) 10 May 2002 (2002-05-10) page 3, line 5 -page 7; figures 1-5	1,3,5,7, 8,11
A	US 4 844 420 A (OSTER NICHOLAS R) 4 July 1989 (1989-07-04) the whole document	1,5,11

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents :

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- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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